

## Guide to the MD Survey Trend Report 2005 through 2008 data

### UNDERSTANDING p-VALUES

A p-value is the probability of obtaining a result at least as extreme as the one that was actually observed given that the null hypothesis is true. For this report the Null Hypothesis is – there is no difference in the data for the years being compared.

When a p-value is below a certain level, you reject the null hypothesis. Typically that level is .05. In this report we note where the p-value is less than or equal to .10 because the sample size is small and therefore it is harder to detect a significant effect. We also indicate where the p-value is  $\leq .05$  and  $\leq .01$ . The p-value does not indicate the size or importance of the observed effect. A significant finding does not imply that the finding is important.

### SIGNIFICANCE TESTING

A Wilcoxon Paired Signed Rank test was used to test the significance of trends for interval or ratio data for the following years: 2005 to 2006, 2006 to 2007, 2007 to 2008 and 2005 to 2008. The choice of this particular statistical test was based on the non-normal distribution of the data. Trends were found significant when the p-value was less than or equal to 0.10.

A McNemar's Test was used to test the significance of trends for nominal/categorical data for the following years: 2005 to 2006, 2006 to 2007, 2007 to 2008 and 2005 to 2008. A Chi-Square test, a well-known test for categorical data, was not used because the data contained the same set of agencies from year to year. None of the nominal/categorical data tested were significant.

### SIGNIFICANCE TESTING CAVEATS

- Overall, the sample size was small, N=30. The smaller a sample size the higher the chance that the test will not detect a significant difference in the data being tested.
- Value presented in report vs. what was tested
  - The percent change columns in the report represent the overall change from one year to the next.
    - Example: Total cancer deaths in 2004 = 6,035 and in 2005 = 6,492, therefore there was an overall increase of 457 deaths (8%)
  - The statistical tests, however, tested summed difference from one year to another year within each agency.
    - Example: An overall increase of 100 deaths could be 10 more deaths per agency which when tested is not significant. Or it could be an increase of 60 deaths for 1 agency, 30 for another agency, and less than 10 for the rest of the agencies which when tested is a significant increase in deaths.
  - Therefore, a high percent change from one year to another is not necessarily more likely to be significant than a small percent change.